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Rush Papers



An Inaugural Dissertation  
on Tetanus. Submitted  
to the Examination of the  
Provost, Trustees, And  
Medical Faculty of the  
University of Pennsyl-  
-vania for the Degree  
of Doctor of Medicine  
on the day of April eight-  
-teen Hundred and Eleven  
by  
John Briscoe Virginia



1840

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1

Since the time of Hippocrates  
down to the present day, Tetanus has  
excited the attention of the most learned  
& ingenious of Medical Writers — It would  
be presumptuous in a mere Tyro in med-  
icine to suppose himself capable of shed-  
ding much light on the treatment of so  
unmanageable a disease — Nor was it  
with this view that I chose Tetanus as  
the subject of my inaugural Disser-  
tation —

The word Tetanus means literally  
a tension or spasm — as it is used in  
medical writings it implies a morbid



character of the disease  
fibres of a living animal —

General

every one of these fibres are liable  
to attack of this disease but those of a  
robust and irritable habit are said to  
be most frequently the victims — hence  
animals are also sometimes affected with  
a disease which is apparently a local form

— then —

It seems to be a disease from which

muscular system and is related to

~~can be traced to the muscular system~~

especially in the  
muscles of voluntary motion, giving rise

to a convulsion and degree of rigidity to the

whole body.  
The fibres also were among



contraction or spasm of the muscular fibres of a living animal —

Persons of every age and of both sexes are liable to attacks of this disease, but those of a robust and irritable habit are said to be most frequently its victims — dumb animals are also sometimes affected with a disease which is apparently a real Tetanus —

—

Tetanus is a disease principally nervous system, and is seated more confined to the ~~muscular system~~ and the especially in the muscles of voluntary motion, giving rise to a considerable degree of rigidity to the whole body.

The Greeks who were among



the first collection of *Myiarchus cinerascens*  
observed. *Tetanus* as a common species  
of all the *Myiarchus* of *Myiarchus cinerascens*  
*Myiarchus* has several varieties or divisions  
which I shall take some notice of hereafter.

On *Myiarchus* the *Myiarchus*

of *Tetanus* in other than *Myiarchus*  
in a few more species known than  
*Myiarchus* which is good that is to say  
for *Myiarchus* brought to the *Myiarchus*

to *Myiarchus* it is much more than any  
and in the *Myiarchus* than in the *Myiarchus*  
and in the *Myiarchus* than in the *Myiarchus*  
in the *Myiarchus* than in the *Myiarchus*



the first cultivators of Medical Science described Tetanus as a universal Spasm of all the Muscles of voluntary Motion; they however had several varieties or divisions which I shall take some notice of hereafter.—

In general the Symptoms of Tetanus, make their appearance in a slow and gradual manner; this however depends a good deal upon its cause, for when brought on from exposure to cold it is much more slow and gradual in its progress than when from an organic lesion though the latter is longer in making its appearance after the



of the corner.

the first

shape is a series of lines and

stiffness of the members of the neck and

form which is soon followed by an

easy transition and then about the

end of the transition shooting back to

over the spine. The rigidity of the

end of the neck again the head to be moved

with difficulty the form cannot be open

as without considerable pain there is also

a stiffness and slight degree of pain at the

root of the tongue which gives rise to a

difficulty in deglutition. The form about

the cartilage epiglottis in moving the

muscles of the back part of the neck



application of the cause.

Among the first symptoms is a degree of lassitude and stiffness of the muscles of the neck and jaws, which is soon followed by an uneasy sensation and tension about the lower end of the sternum, shooting back towards the spine. The rigidity of the muscles of the neck causes the head to be moved with difficulty; the jaws cannot be opened without considerable pain; there is also a stiffness and slight degree of pain at the root of the tongue, which gives rise to a difficulty in deglutition. The pain about the cartilago ensiformis increasing, the muscles of the back part of the neck are



the bones of the lower jaw are  
-ing the bone of the lower jaw.  
the lower jaw at the same time an opposite  
with of bone forming the lower jaw so  
close in contact with the upper jaw so  
- the it is impossible to open the mouth.  
The disease is then called Pseudoepithelioma

form -  
The muscles of the neck  
now become rigid and are drawn strongly  
backwards the lower jaw about the face  
increasing in volume returns every day  
on fifteen minutes and with it the disease  
of the muscles of the lower jaw and back  
are with some violence and pain return  
- the disease then gradually increases  
-ing the muscles of the lower jaw



Thrown into violent contraction drawing the head backwards. The Muscles of the lower jaw at the same time are affected with spasm, drawing the lower jaw so close in contact with the upper, as to render it impossible to open the Mouth. The disease is then called Trismus or Locked Jaw.

The Muscles of the extremities now become rigid, and are drawn strongly backwards; the pain about the praecordia, increasing in violence, returns every ten or fifteen minutes, and with it the spasm of the Muscles of the lower jaw and neck are with more violence and pain renewed. The disease thus gradually increasing, the Muscles of the spine become



offered, hunting the body  
and the head and the  
the disease is called spiritism.  
The thing variety of the disease is  
the disease is called spiritism.  
and the head and the  
as to know the cause to the  
preparing the head and the  
- ready enough, the head and the  
the cause is not known and the  
have called the disease. This is a  
- very ~~and~~ has been known and  
is thought by the people to be  
to spirit.

The Abdominal disease is  
the cause of the disease and the  
and the head and the



6  
affected, bending the body backwards,  
and the neck and Thorax forwards. When  
the disease is called Opisthotonos.

The third variety of this disease is, when  
the muscles seated on the front of the body  
and neck act with so much violence,  
as to draw the chin to the Sternum, the  
pressing the Thorax, the neck consid-  
-erably curved, the hands clinched, and  
the lower extremities extended, and has  
been called emprostotonos. This is a va-  
-riety ~~which~~ has seldom occurred, and  
is thought by Dr Mosely impossible  
to exist.

The abdominal muscles through-  
out the whole of the disease are violently  
contracted, and extremely hard to the touch.



When the Chinese came to  
the relief of the Chinese of Voluntary  
except those which were the English which  
at times are unexpected. In some respects and  
acting at the same time keep the head  
themselves and expectant. I thought it in line  
with the English which is to be  
probably a considerable time at length  
be even affected with the same and is often  
thru the Chinese the latter. The former  
be even known the eyes are distant  
and in some cases in their pockets the  
teeth exposed by the action of the  
Chinese among the Chinese themselves  
the same in a short time or incident  
can be seen in some cases and to



When the disease continues to increase, the whole of the muscles of voluntary motion, except those which move the fingers, which at times are unaffected, become affected, and acting at the same time, keep the head, trunk and extremities straight & inflexible - The tongue, which retains its mobility a considerable time, at length becomes affected with spasm, and is often thrust between the teeth. The forehead becomes furrowed, the eyes are distorted and immovable in their sockets, the teeth exposed by the action of the muscles drawing the cheeks towards the ears - In a short time a violent convulsion comes on and puts an end to



constant but suddenly for two or three  
- weeks - The disease in this disease is  
- early & pain and sometimes totally  
The brain is sometimes covered with  
- something in laborious & painful  
- difficult to see one most frequently affected  
- which are common in the disease  
- movement and change - These diseases  
of the brain the patient refuses to  
- and from a fear of exciting a return  
from the difficulty of diagnosis  
The disease is generally over the  
- others for great time and irregular  
- means sometimes slow & hard  
The disease in this disease is very  
to the unfortunate patient.



to the unfortunate sufferer.

The pulse in this disease is very various; sometimes slow & hard; at others frequent, small, and irregular. The bowels are generally constipated: from the difficulty of deglutition, and from a fear of exciting a return of spasm, the patient refuses both nourishment and drink. Those muscles which are concerned in respiration & deglutition are most violently affected. Breathing is laborious & painful. The urine is sometimes voided with difficulty & pain and sometimes totally suppressed. The spasms in this disease are not constant, but subside for two or three



Minutes giving the history of the  
Chapter of even but by the slightest  
attention or inspection the history returns  
with undoubted evidence. The history  
known perfectly our names and the names  
our names known with the best records  
comparing with our and his history.

The tracing up the corner of the  
corner is a necessary step to say  
on a very full and interesting account  
of them is given by the book, in his  
historical observations and inquiries  
the day all the names and the names  
and corner of the corner set by  
with historical ability and interest.



minutes, giving the patient a ~~slight~~  
 degree of ease; but by the slightest  
 motion or impression the spasms return  
 with redoubled violence. The patient

remains perfectly conscious, and the senses  
 are unimpaired, untill the last violent  
 paroxysm puts an end to his sufferings.

In treating of the causes of Tet  
 -anus it is unnecessary to say <sup>to be discussed</sup> ~~but later~~,  
 as a very full and interesting account  
 of them is given by Dr Rush, in his  
 Medical observations and inquiries.  
 He says "all the remote and predispos  
 -ing causes of Tetanus act by inducing  
 preternatural debility and irritability



and certainly there are some  
in the production of this disease  
state of the blood is greatly increased  
of being long thinks that the cause  
is of nature - Dr. Hamilton  
as respects either the pathology or  
but little can be learned from them  
on those numbers of Epileptics. All  
although it is not a great thing  
them which is not but the system  
remains and in the case of the patient  
can be thereby in some cases of epilepsy  
and for those brought on by the  
= either by repetition or in one attack  
of some day Epileptics can also arise  
in the brain which is not ~~the~~ the



in the muscular parts of the body—

Spasmodic says Hippocrates are all induced either by repletion or inanition; and for those brought on by the former we should make use of depleting remedies, and in the case of the latter remedies which support the system although Dr. Mosely laid great stress on those remarks of Hippocrates, still but little can be learned from them as respects either the pathology or cure of Tetanus— Dr. Hamilton of Edinburgh thinks that the castic state of the bowels is greatly concerned in the production of this disease; and certainly there are some circumstances







stances which favour this opinion.  
 for we frequently see <sup>spasmodic</sup> diseases induced from the same cause,  
 as Cholera, Hysteria, &c, and we gene-  
 -ally find Tetanus occurring in those climates  
 and seasons in which the intestinal canal  
 is extremely torpid and constipated. I mostly  
 remark, that women seldom have more than  
 two stools a week in the West Indies. But  
 perhaps Dr Hamiltoun's theory leads him  
 to far when he proposes to cure Tetanus  
 by pumping alone, for certainly there  
 are cases which come on without any  
 previous constipation. I have seen a  
 case which came on one hour after the pa-  
 -tient received a punctured wound in the wrist  
 the boy being previously in every respect in perfect health



1145

I am deeply indebted to the kindness of  
the Government of the United States  
of the institution & for the loan of the  
reproducing the fragments of the  
man in the case of this disease -  
but through the kindness of the  
to the use of the same was not  
any respect to the nature of the  
"Proctor" the disease "and to the  
reference upon some one already  
in the list of its chief officers" the  
in the United States -  
to receive the various records which  
been prepared in the case of this



12  
Cure

I am fully impressed with the truth of the sentiments of the learned professor of the institutes & practice of Medicine respecting the frequent failure of Physicians in the cure of this Disease - The bad success of Physicians he imputes, "to the use of the same remedies, without  
"any respect to the nature of the causes which  
"produce" the disease, "and to an undue  
"reliance upon some one remedy under  
"a belief of its specific efficacy". Bearing in mind those sentiments, I am enabled to review the various remedies which have been proposed in the cure of this Disease.



and the different forms of  
prognosis by the tumor -

Concerning the first mentioned subject I  
shall mention -

1<sup>st</sup> Of bloodletting. I have observed that  
the tumor from the throat and upper  
- part can be cured by the letting or cure  
- creating hemorrhoids. At Moscow I treated the  
case of an American who received a fracture  
of the cranium which was cured  
by violent inflammation the cure by  
the loss of a large quantity of blood  
and this movement - I have seen  
repeated by others, when bloodletting  
and hemorrhoids have been successful  
in a case cured by the same remedy



and the different plans of practice proposed by Authors -

Among the first remedies which I shall notice is,

1<sup>st</sup> Bloodletting. Galen observes, that spasms from plethora and inflammation are to be cured by depleting or evacuating remedies. Dr Mosely relates the case of a Man who received a fracture of the cranium, which was succeeded by violent inflammation &c, cured by the loss of a large quantity of Blood and other evacuations - A Case is also related by Dr Rush, when bloodletting was used successfully. Currie of Liverpool mentions a case cured by the same remedy.







Bloodletting however should not be employed, unless the pulse and inflammatory symptoms indicate it.

2<sup>nd</sup> Purges. These are strongly indicated in all cases when the bowels are obstinately constipated, or when the disease arises from the presence of worms or any irritating matter, in the intestinal canal. Dr Hamilton places so much confidence in the use of purgatives, that he almost entirely relies on them in the cure of Tetanus. Most strongly recommends purges in high fevers, in cases accompanied with inflammatory symptoms, or when venesection is necessary. Doctor Wright







Munro and Boerhaave all bear testi-  
-mony to their use in the cure of Tetanus.

3<sup>d</sup> Emetics. These are remedies which  
have been seldom used in Tetanus; but  
from what we know of their general power  
over the muscular system and their utility  
-ity in cases of spasmodic stricture, we  
would be led to conclude that they might be  
employed with considerable advantage  
in some cases. There is a case of Tetanus  
mentioned by Dr Currie, which continued  
with great violence for several days, when  
a nausea & vomiting came on, which com-  
-pletely relaxed the muscular system, and  
the patient recovered with great rapidity.



When one is in a position to see  
many at the same time. When one  
- looks on a case when one looks at the  
effect of understanding the form of the  
instructing the student who at the same  
time begins with a suitable form -

4. *Method*. When instruction is taught

one from a fundamental knowledge of any other  
organic basis. In setting one in motion  
so as to exhibit the knowledge of the form  
instructing the student. This is the  
- then is supposed to know the method by which  
- finding the fundamental principle or the other  
which is the corner of the of one's own  
though instructing the communication in  
- then the first object of the instruction is



Wine and Bark were however also  
 used at the same time. Dr Rush re-  
 -lates a case, where an Emetic had the  
 effect of unlocking the jaws of the patient  
 instantly; the patient was at the same  
 time seized with a violent fever —

4<sup>th</sup> Incision. When Tetanus is brought  
 on from a punctured wound or any other  
 organic lesion, making an incision  
 so as to dilate the wound freely, often proves  
 instantaneously successful. This opera-  
 -tion is supposed to prove successful by di-  
 -viding the punctured nerve or tendon  
 which is the cause of the spasm and  
 thereby intercepting the communication be-  
 -tween the part diseased & the sensorium commune



This does not seem to me to be a  
- long theory of the war after the  
in order to suppose that in some measure  
at least the various powers were by means  
- ing that tension of the last which usually  
arises from ferment.

5. Opinion. This article has been  
- ed to by physicians on one of the principles  
remains in the case of tetanus, & it then  
is necessary to doubt whether in some cases  
from a good basis it is not really caused the  
- cesses without the aid of other remedies  
the mind not be surprised that physicians  
- ing nearly on opinion should be so divided  
- ed. This is a question of not business to  
attributed to the physicians of this country.



This does not seem to me a satisfactory Theory of the use of the Knife. I am inclined to suppose, that in some measure at least the incision proves useful by removing that tension of the part, which usually arises from punctures.

5<sup>th</sup> Opium. This article has been resorted to by Physicians as one of the principal remedies in the cure of Tetanus. Yet there is reason to doubt, whether in cases arising from organic lesion, it has really cured the disease without the aid of other remedies. We need not be surprised that physicians, relying solely on opium, should be disappointed. This disappointment is not however to be attributed to the feebleness of this remedy, but



to the circumstances of the case  
 - (the number) being only the number  
 the top of the disease and continuing the  
 - down to the continuation of a single symptom  
 having no attention to the state of the system  
 in general. Opinion is frequently made in the  
 form of any utility in the disease. The  
 effect of opinion in this disease is that it  
 - is a sign of our own power in the  
 - system. The disease of the system is  
 the given. This gives a strength in the  
 - form of the system.

Dr. Moore From the constitution  
 as well as the thinning effects  
 of this remedy has been considered in the  
 it would have been useful in the case



to the circumstance of Physicians, (as Dr Ham-  
 -ilton remarks) disregarding the general  
 history of the disease, and confining them-  
 -selves to the consideration of a single symptom,  
 paying no attention to the state of the system  
 in general. Opium Dr Mosely says he never  
 found of any utility in this disease. The  
 dose of Opium in this disease should be  
 large; as high as our answer in twen-  
 -ty-four hours, Dr Mosely mentions, may  
 be given. Lind gave a scruple in twenty-  
 -four hours -

6<sup>th</sup> Wine From the nutritious  
 as well as the stimulating effects  
 of this remedy, we would conclude that  
 it would prove useful in the cure



of the same. Prof. Dr. ...  
... of the same ...  
... with advantage ...  
... to be given in  
large quantities.

of 1000 lbs This is much as ...  
... has been used with advantage  
... a case of its ...  
... the ... of ...  
... in the case of ...  
... than ... of ...  
... a ... of ...  
... effects. ...  
... at the same time as ...  
... the ...



of Titanns. Professor Rusk and Dr. Currie of Liverpool have employed this remedy with advantage. To be useful they advise it to be given in large quantities.

7.<sup>th</sup> BARK. This as well as some of the other Tonics has been used with advantage. Dr. Rusk relates a case of its beneficial effects. I have seen the Oxide of Arsenic administered in the dose of one sixth of a grain three times a day & increased to a grain and a half apparently with very good effects. There was indeed other remedies used at the same time, as opium, wine, &c.; the patient recovered.



of the Constitution Bill.

has now the 31. June in the  
his or eight days with the most happy  
effects in a case of Intemperance. Indeed this  
I shall place the following of them  
though it is not strictly speaking an  
one yet it is so nearly allied to the operation  
and that it will not be improper to speak  
of it under this head. Dr. Ferriarum says  
- that several cases of Intemperance in which  
he saw the following of them with complete  
success, given in the case of one person the  
times a day - Dr. Ferriarum relates a case  
of Spasmodic in which he saw this following  
with the best effect. This follows the  
probable utility of it in Intemperance.



§. The Essential Oils. Professor Rush  
 has used the ol: succini in the dose of  
 six or eight drops with the most happy  
 effects in a case of Tetanus. Under this  
 head I shall place the Balsam of Peru,  
 though it is not strictly speaking an  
 oil, yet it is so nearly allied to the essential  
 oils, that it will not be improper to speak  
 of it under this head. Dr Kirkland men-  
 -tions several cases of Tetanus in which  
 he used the Balsam of Peru with complete  
 success, given in the dose of one dram three  
 times a day. Dr Rogers relates a case  
 of Epilepsy in which he used this Balsam  
 with the happiest effects. This favours the  
 probable utility of it in Tetanus.



highly of the use of letters in the case  
 of letters. I have not expected more benefit  
 from the application of letters in the case of  
 from the application of letters in the case of  
 many without the same.

10. Observations. The efficacy of  
 this remedy has been very satisfactory  
 known by several authors of modern times  
 but perhaps more strikingly in a case  
 related by the late Dr. Keene of the University  
 of Oxford who relates a case where a  
 - motion affected a cure. The remedy was  
 that in many other cases the same  
 the foot. This was in the case of  
 the first instance but certainly it was  
 different in the second instance. There is in  
 - even a great objection to the use of the



9<sup>th</sup> Blisters. Dr Girdlestone speaks highly of the use of Blisters in the cure of Tetanus. I would expect more benefit from the application of Mustard or the actual cautery, from remedies recommended by the Ancients in many violent diseases —

10<sup>th</sup> Salivation. The efficacy of this remedy has been very satisfactorily proven by several Authors of respectability, but perhaps more strikingly in a case related by the late Dr Young of Maryland. Dr Rush also relates a case where a salivation effected a cure. Dr Mosely says that mercury often kills than cures the patient; this may be the case in the West Indies, but certainly its very different in the United States. There is however a great objection to the use of mer-







curry, that of its being so slow in its operation, it should however be used in conjunction with other remedies.

II. <sup>11</sup> Cold Bath. This is a remedy almost as old as the science of Medicine. Hippocrates was particularly attached to its use in this disease, and his restrictions in the use of it, are truly deserving of attention. He observes that it should only be used in the summer season, and in patients that are of a plethoric and robust habit. This practice was nearly forgotten, when, to the great honour of Dr. Wright of Le-  
~~am, he called the attention of the public~~  
~~ma, he called brought its use into~~  
~~public notice.~~

public notice. The success of Dr. Wright in the cure of Tetanus



with the Cal State in order of the  
of Boston Boston and Boston  
already arrived in the city. Boston  
near the Cal State with money in the  
case of Boston. In the case of this  
money it appears from the present  
position in the hands of the various  
more particularly in the case of the  
Boston that we should pay that  
attention to the state of the system.

12. Boston Boston. This is a summary  
which shows most good results that  
of the system is a good deal better the  
~~actual situation of the system~~  
~~of children, when the system is~~  
~~at all times. This summary was drawn~~  
~~from the Boston~~



with the Cold bath, as well as the success of Doctors Cochrane and Currie, have clearly evinced its efficacy. Dr Rush has used the cold bath with success in the cure of Tetanus. In the use of this remedy it appears, from the frequent failures in the hands of Physicians, and more particularly in those of Dr Girt-  
-leston, that we should pay strict attention to the state of the System.

12<sup>th</sup> Warm Bath. This is a remedy which promises most good when the heat of the System is a good deal below its natural standard, and the patient complains of chilliness, when the pulse is small & slow - This remedy was known and recommended by A. Celsus -



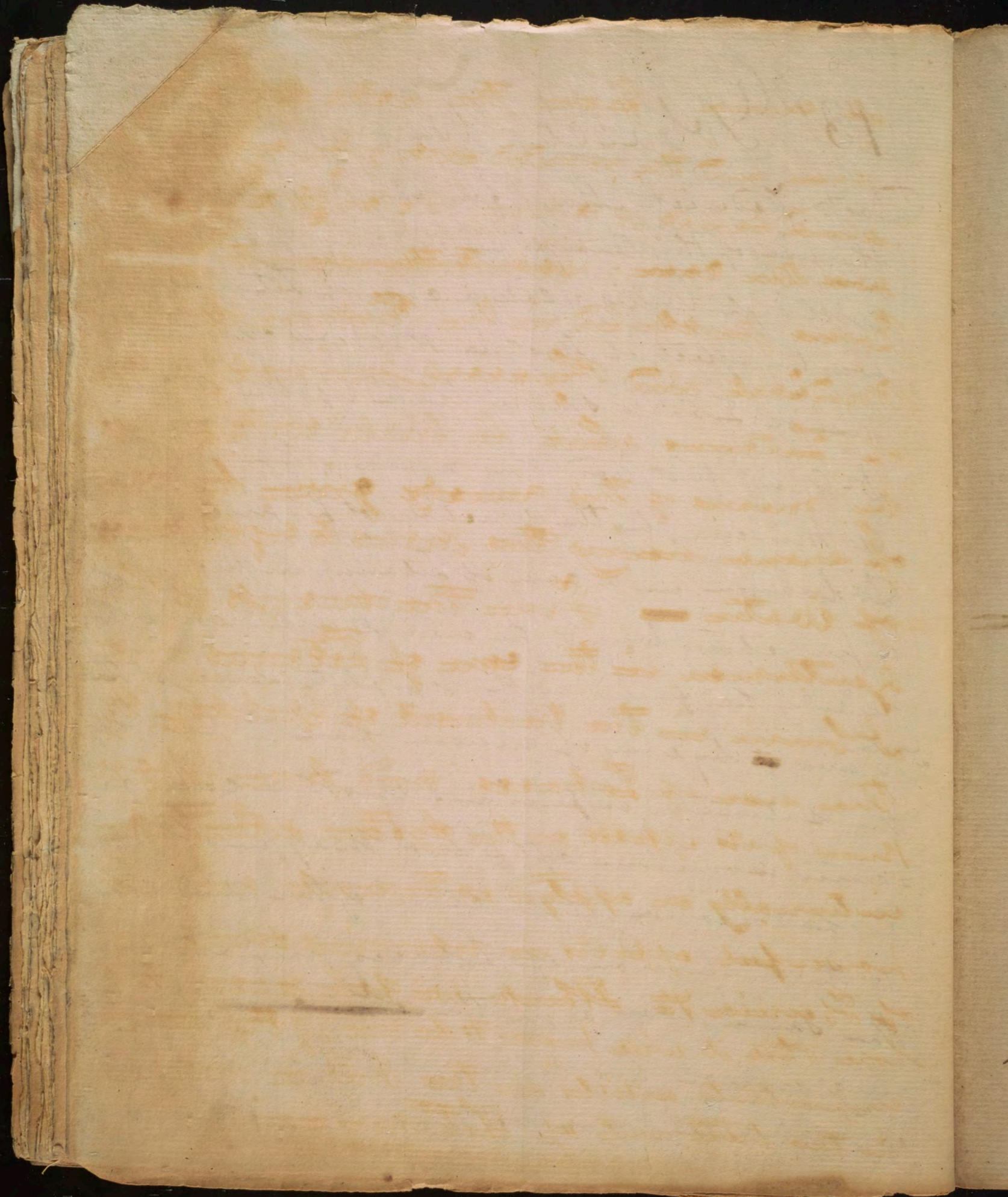
13th March 1844

My dear friend  
I have just received your letter of the 10th inst. and am  
glad to hear that you are well. I am  
at present in the city of London and  
am very busy with my work. I  
am sorry that I cannot write to you  
more often. I am, however, very  
kindly to you and hope to hear from  
you soon. I am, my dear friend,  
very truly yours,  
J. B. [Signature]



13- Tobacco. We are indebted to  
 Doct. Frederick May, for our knowledge of  
 the use of this Article in the cure of Tetanus.  
 although Willis relates a case of Tetanus which  
 was the effect of Tristria that was cured by the  
 use of Tobacco smoke blown up the nose.  
 Dr. May first used this remedy while a student  
 of Medicine, by the direction of his preceptor  
 Dr. Leaven, in a case of Tetanus induced by  
 a punctured wound; he used it after every other  
 remedy had failed, with complete success. The  
 doctor ~~gave~~ <sup>gave</sup> by way of enema half a pound of  
 the saturated infusion. Another case oc-  
 -curred sometime after to Dr. May, in which  
 he had recourse, at the close of the disease,  
 to the infusion of Tobacco prepared in  
 the same way as in the ~~other case~~ <sup>former</sup>; mak-  
 -ing use of two ounces of Tobacco to eight  
 of water and giving it all at once by way







of enema, from the extraordinary  
 dose, and the exalted state of the patient, we  
 should expect it to prove instantly fatal as  
 was the case. ~~On the year 1808 Doct.~~  
~~On the year 1808 Doct.~~

Rogers published in the Philadelphia  
 Medical and Physical Journal, a Case  
 of Tetanus which he treated with success  
 by means of this remedy given by way  
 of enema, using two Ounces to eight Ounces  
 of water — From the success of those  
 Gentlemen in the cure of Tetanus, and of  
 J. Currie in the treatment of Epilepsy by  
 the use of Tobacco, and from what we  
 know of its effects on the system when taken  
 internally or applied externally, and its  
 powerful effects in relieving some cases  
 of Hemorrhoids, &c., I think we have reason to  
 hope that it will prove to be one of the most  
 important articles of the Materia Medica  
 in the treatment of Tetanus —



